REMARKS/ARGUMENTS

The claims 1, 3 and 5 have been amended to make some minor corrections and to clarify how the heavy product in claim 5 is used, i.e., it is used to generate power and/or heat. Claims 6 and 7 have been amended to change their dependency to claims 1. New claims 9-11 recite some of the preferred boiling ranges for the light fraction and other features of the inventive process.

Claim Rejection – 35 U.S.C. § 112

Claim 5 has been amended to specify that the heavy product obtained by distilling the thermally cracked intermediate fraction is used to generate power and/or heat. In view of the amendment, it is believed claim 5 now fully complies with 35 U.S.C. § 112. Therefore, it is requested that the rejection of claim 5 on this basis be withdrawn.

Claim Rejections - 35 U.S.C. § 103

The rejection of claims 1- 8 under 35 US.C. 103 (a) as being unpatentable over Myrstad et al (WO 98/10036) is respectfully traversed.

The present invention provides a process for producing a pipeline – transportable crude from a bitumen feed involving six distinct steps. In step (1) the bitumen feed is divided into two fractions, the first fraction comprising between 20 and 80 wt% of the feed, while the second fraction comprises between 80 and 20 wt% of the feed. In step (2) the first fraction is distilled into a light fraction boiling below 380 ºC and a residual fraction, which residual fraction is thermally cracked in step (3). In step (4) the thermally cracked product from step (3) is distilled into one or more light fractions boiling below 350 ºC, optionally one or more intermediate fractions boiling between 350 and 510 ºC, and a heavy fraction boiling above at least 350 ºC. In step (5) the light fraction obtained in step (2) and the light fraction(s) obtained in step (4) are combined with the second fraction in step (1) (the untreated portion of the bitumen feed) to obtain a pipeline–transportable crude. In step (6) the heavy fraction obtained in step (4) is used for the generation of power and/or heat.

Myrstad (WO 98/10036) discloses a process for improving the transportability of a heavy crude oil involving essentially three steps. The first step in Myrstad is similar to the first step of present process in that the heavy oil is separated into two parts. In the second step in Myrstad, one part of the heavy oil is upgraded to a more liquid oil by thermal cracking in a hammermill type of apparatus. In the third step the upgraded part of the heavy oil from the second step is

mixed with the remaining untreated heavy oil to produce an oil having desired transportation properties (Myrstad, page 3, lines 9-19).

It is acknowledged on page 5 of the subject Office action that Myrstad "does not specifically disclose step (2) of the present process. In fact, as discussed below, Myrstad does not specifically disclose step (2), step (3), step (4), step (5) or step (6) of the present process.

Step (2) of the present process requires distillation of the first fraction into a light and residual fraction, while in step (3) only the residual fraction is thermally cracked. Such distillation prior to thermal cracking is not taught or suggested by Myrstad. Instead, Myrstad teaches supplying the bitumen feed mixed with sand and water directly to the hammermill type of reactor without any prior distillation to produce a cracked hydrocarbon product. The cracked hydrocarbon product is then added to the untreated bitumen with significant lowering of both viscosity and pour point. (Myrstad, page 10, lines 24-29).

Step (4) of Applicant's process requires a further distillation step which is not remotely taught of suggested by Myrstad. In step (4) of Applicant's process the thermally cracked product obtained in step (3) is distilled into one or more light fractions, optionally into one or more intermediate fractions and a heavy fraction. In marked contrast, in Myrstad the entire cracked hydrocarbon product is added to the untreated heavy oil, without any separation into fractions.

Step (5) of Applicant's process involves combining the light fractions from steps (1) and (4) with the untreated portion of the bitumen feed. This is not suggested by Myrstad which teaches combining the entire cracked hydrocarbon product with the untreated heavy oil.

Regarding step (6) of the present process, since Myrstad never separates the fuel oil from the rest of the bitumen, either before or after thermal cracking, and since Myrstad adds the entire cracked hydrocarbon product to the untreated bitumen, Myrstad can not reasonably be said to suggest step (6) wherein the heavy fraction separated in step (4) is used for the generation of power or heat.

The Examiner, apparently recognizing that Myrstad does not disclose step (2) or a number of the other steps in Applicant's process, takes the position that these steps would be obvious because: "It is known to those skilled in the art that fuel oil is the required feed in thermal cracking and middle distillates are value-added products needed in the process. Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the Myrstad invention and separate the middle distillate portion (150 to 350°C fraction) in an additional step (2), and take only the heavy oil portion (>350°C) into the thermal cracking reactor." This position is untenable for a number of reasons as discussed below.

Myrstad itself contradicts the statement "that fuel oil is the required feed in thermal cracking". The feed to the thermal cracking process of Mrystad is bitumen, not fuel oil. There is no indication in Myrstad that the fuel oil fraction is ever separated from the bitumen, either before or after thermal cracking. Hence, fuel oil is not "the required feed in thermal cracking". Myrstad clearly teaches bitumen can be used as feed to a thermal cracking process, and further suggests it is not necessary to separate out the fuel oil fraction from the bitumen prior to thermal cracking.

Myrstad also contradicts the statement that middle distillates are value added products "needed in the process". As in the case of fuel oil, the middle distillates in Myrstad are never separated from the bitumen feed before or after thermal cracking. The bitumen feed is thermally cracked without separation of the middle distillates or the fuel oil, and the entire cracked hydrocarbon product is added to the untreated bitumen to significantly lower its pore point and viscosity. Thus, middle distillates are not needed in the process of Myrstad, at least not as a separate fraction. There is simply no motivation provided by Myrstad to divide the bitumen into different fractions by distillation prior to, or after, thermal cracking.

Regarding present claims 3 and 4 wherein the thermally cracked product is split by distillation into light, intermediate and heavy fractions, the Examiner notes that Myrstad discloses on page 10 that the hydrotreated product contains 54% middle distillates and 46% fuel oil, which is true. However, in Myrstad the middle distillates and fuel oil are never separated into fractions from the cracked hydrocarbon product. Thus, Myrstad does not teach taking a middle distillate cut or a fuel oil cut, and certainly does not teach taking an intermediate fraction cut. Instead, Myrstad teaches mixing the entire uncut cracked hydrocarbon product with the untreated bitumen.

The fact that Myrstad knew that middle distillates and fuel oil boiling range components were present in the cracked hydrocarbon product, but chose not to separate these fractions, and instead mixed the entire cracked hydrocarbon product with the untreated bitumen, supports the unobviousness of claims 3 and 4. Clearly Myrstad (who is one skilled in the art) did not believe it was necessary or desirable to separate middle distillates or fuel oil fractions from the thermally cracked product prior to mixing it with the untreated bitumen.

The benefits of distilling the bitumen into different fractions prior to thermal cracking, and the benefits of further distilling the thermally cracked product into light, intermediate and heavy fractions after thermal cracking, is only taught in Applicant's application, which teachings, of course, cannot be used as a basis for the rejection.

Regarding present claim 5 wherein the intermediate fraction is thermally cracked followed by distillation into a light product and a heavy product, clearly these limitations are not remotely taught or suggested by Myrstad. The intermediate fraction recited in claim 5 is distilled from the product of thermally cracking the residual fraction obtained in step (2). Since Myrstad does not disclose step (2), step (3) or step (4) which produce the intermediate fraction(s), it cannot be obvious from the Myrstad to thermally crack the intermediate fraction and to subsequently distill it into a light product and heavy product.

In the Office action it is stated that it would have been obvious to increase the production of lighter fractions to be used in step (5) "Since the lighter components are more desired for blending in step (5)". The basis for this statement is unclear. Certainly it is not based on Myrstad, because Myrstad never separates the lighter components from the cracked hydrocarbon product. As discussed above, the entire uncut cracked hydrocarbon product is added to the untreated bitumen in Myrstad.

Regarding present claims 6-8, these claims are indirectly dependent on claim 1and thus contain the same limitations as claim 1 to the six step process. Therefore, claims 6-8 are believed patentable over Myrstad for the reasons given above in connection with claim 1.

New claims 9-11 are also directly or indirectly dependent on claim 1, and are believed patentable for the same reasons as discussed above in connection with claim 1.

For all of the above reasons and in view of the amendments, claims 1-8 and new claims 9-10, are believed to be patentable and in condition for allowance, which action is respectfully requested.

Respectfully submitted,

PETRUS JOHANNES WALTERUS MARIA VAN DEN BOSCH ET AL

By: /Charles W. Stewart/
Their Attorneys, Charles W. Stewart and Leonard P. Miller
Reg. Nos. 34,023 and 26,004
(713) 241-0360

P. O. Box 2463
Houston, Texas 77252-2463